Limited use of surgeon's advice on exercise for knee osteoarthritis

Ryaa, Sofie; Ingelsrud, Lina H; Skou, Søren T; Roos, Ewa M; Troelsen, Anders

Published in:
Danish Medical Journal

Publication date:
2018

Document version
Publisher's PDF, also known as Version of record

Limited use of surgeon's advice on exercise for knee osteoarthritis

Sofie Ryaa[1], Lina H. Ingelsrud[1], Søren T. Skou[2, 3], Ewa M. Roos[2] & Anders Troelsen[1]

ABSTRACT

INTRODUCTION: The Good Life with osteoArthritis in Denmark (GLA:D) programme consists of patient education and supervised exercise therapy and adheres to clinical guidelines for knee osteoarthritis (OA). The purpose of this study was to present the treatment choice and clinical results of patients who were advised to participate in GLA:D before deciding on undergoing knee replacement.

METHODS: Patient records from all patients with knee OA consulting one orthopaedic surgeon in 2015 were reviewed to identify those who were advised to seek GLA:D. Radiologic OA was classified with Kellgren-Lawrence (KL) grade 0-4: none-severe. Results after three months were extracted from the GLA:D database, including a visual analogue scale (VAS) for knee pain 0-100: best-poorest.

RESULTS: Out of 142 patients with primary referrals due to knee OA, 83 (58.5%) were advised to participate in GLA:D. They had a mean age of 65.0 years (standard deviation (SD): ± 10.7), 59 (71.1%) were female, 34 (44.8%) had a KL grade 3-4 and were either not eligible for surgery or awaiting surgical decision. Only 18 (22%) participated in GLA:D, out of whom 14 (16.9%) had available three-month data. They improved (mean (SD)) from 61.4 (± 18.6) to 42.7 (± 25.1) ($p < 0.001$) with respect to VAS pain after three months.

CONCLUSIONS: Few patients followed the surgeon's advice on GLA:D participation, indicating that treatment with GLA:D is underutilised. The pain reduction found in GLA:D participants confirms that patient education and supervised exercise therapy are beneficial prior to deciding on knee replacement, or if surgery is not indicated.

FUNDING: none.

TRIAL REGISTRATION: not relevant.

Knee osteoarthritis (OA) is a common condition in Denmark. One out of five Danes have osteoarthritis [1], and knee OA is one of the most common types of osteoarthritis. Around 8,000 knee replacement surgeries are performed annually in Denmark [2]. Prior to replacement surgery, Danish clinical guidelines on knee OA recommend education and exercise therapy to improve physical function and reduce pain. Furthermore, it is recommended that the exercise therapy be supervised initially. Additionally, patients who are overweight should lose 5% of their body mass [3]. International guidelines describe these non-operative treatments as the core treatment for all patients with knee OA [4]. The Good Life with osteoArthritis in Denmark (GLA:D) programme is an initiative that meets the recommendations of non-surgical treatment described above for treatment of knee and hip OA. GLA:D treatment was implemented in 2013 after it was demonstrated that it was feasible and effective in a pilot study [5], and GLA:D is now offered nationwide at physiotherapy clinics and municipalities in Denmark [6]. GLA:D consists of two sessions of patient education provided by physiotherapists followed by six weeks of neuro muscular exercise. The exercise therapy aims at improving sensorimotor control and functional stability [7]. Based on data from more than 3,000 patients, GLA:D was found to improve pain, function and quality of life (QOL) at three and 12 months. Furthermore, fewer patients took painkillers following GLA:D, and fewer patients were on sick leave 12 months after GLA:D compared with the year prior to GLA:D [8]. A recent randomised, controlled trial found that total knee replacement followed by non-operative treatment was more effective in relieving pain and improving knee function than non-operative treatment alone. However, the non-operative treatment group also had clinically important improvements allowing three out of four to postpone knee replacement for at least one year, and additionally, the surgical treatment had a higher rate of adverse events [9].

The optimal time-point and symptom severity indicating that surgery is relevant has been extensively debated in the scientific literature [3, 4, 10]. Therefore, pursuing non-operative treatment, such as the GLA:D concept, may be a good alternative if the orthopaedic surgeon is not convinced that surgery is optimal at that time.

The aim of this study was to investigate the patients' choice of action after being advised to participate in GLA:D by an orthopaedic surgeon before deciding on undergoing knee replacement. A secondary aim was to describe the clinical results for those who chose to participate in GLA:D.

METHODS

The reporting of this retrospective cohort study adheres to the STROBE guidelines. The study included all patients

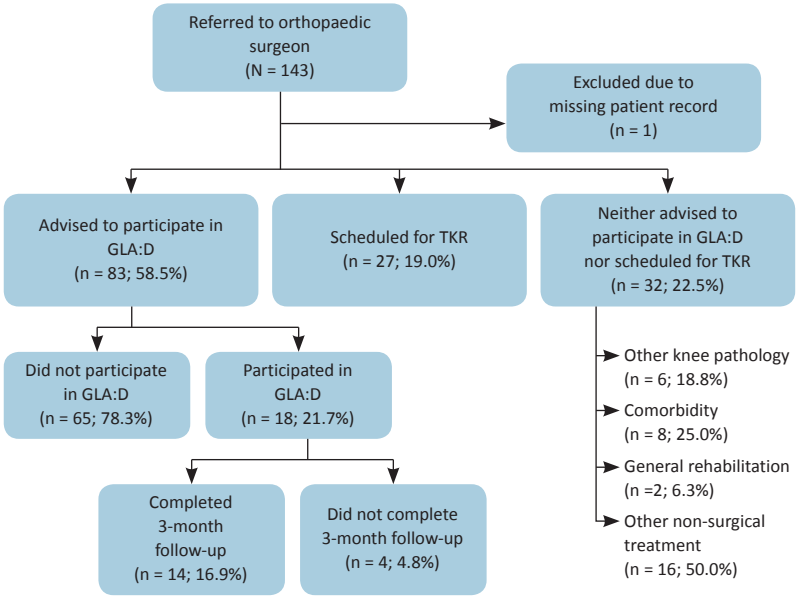
ORIGINAL ARTICLE

1) Department of Orthopaedic Surgery, Hvidovre Hospital
2) Research Unit for Musculoskeletal Function and Physiotherapy, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark
3) Department of Physiotherapy and Occupational Therapy, Næstved-Slagelse-Ringsted Hospitals, Denmark

Dan Med J 2018;65(6):A5487

FIGURE 1

Flow chart presenting the clinical course of treatment for patients seen by a single orthopaedic surgeon in one year.



GLA:D = The Good Life with osteoArthritis in Denmark programme; TKR = total knee replacement.

with knee OA referred to a single orthopaedic surgeon in 2015 at the orthopaedic department at a public hospital in Denmark. This surgeon was chosen due to his systematic recommendation of GLA:D when total knee replacement was not indicated, when prior non-operative treatment had not been undertaken or was not considered optimal, or if the patient did not wish to undergo surgery. The following patient groups were excluded: patients referred for a second opinion on complex knee situations with or without arthroplasty treatment, evaluation of failing arthroplasty, patients with scheduled re-visits after non-operative treatment and patients who were re-referred after attempts or advice on non-operative treatment. Also, all consultations by the surgeon related to hip disease were not considered in this investigation.

Patient records were reviewed manually to confirm the diagnosis of knee OA and to determine whether the patient had been advised to participate in GLA:D. The degree of knee OA was classified using the Kellgren-Lawrence (KL) grade. The KL grading system classifies OA from 0 (none) to 4 (severe) based on the radiological features of OA (formation of osteophytes, joint deformity, narrowing of joint space and sclerosis) [11]. If patients had bilateral knee problems, the KL grade for the knee with the most dominating symptoms was recorded. If symptomatic dominance was not clearly stated, the knee with the more severe KL grade was recorded.

In the GLA:D program, patients complete a set of questionnaires prior to participation and at their three- and 12-month follow-up [8]. For this study, three-month follow-up data on knee pain and knee-related QOL were extracted from the GLA:D database in March 2016. Average pain in the poorest knee during the past month was assessed using the Visual Analogue Scale (VAS) from 0 (no pain) to 100 (worst pain imaginable) [12]. Knee-related QOL was assessed with the QOL subscale of the Knee iInjury and Osteoarthritis Outcome Score (KOOS). The KOOS consist of five separately scored subscales that are scored from 0 (extreme knee problems) to 100 (no knee problems). In the GLA:D database, only the QOL subscale is collected [13, 14].

Statistics

Data were found to be normally distributed on the basis of QQ plots, histograms and the p-value of the Shapiro-Wilk test > 0.05. Data were presented descriptively as n (%) for categorical variables and mean (standard deviation (SD)) for continuous data. Patients were grouped into: 1) advised GLA:D participation, 2) scheduled for total knee replacement (TKR) or 3) neither candidate for TKR or GLA:D. Comparison between groups was performed with chi squared test or the Fisher-Freeman Halton Exact test for categorical variables and the one-way ANOVA test for continuous data. The significance level was set to 0.05. IBM Statistical Package for the Social Sciences (version 24) was used for analysis.

Trial registration: not relevant.

RESULTS

Manual review of patient records identified 143 patients with a primary referral to the orthopaedic surgeon due to knee OA. Among these patients, 25 had bilateral symptoms. One patient was excluded from further analysis due to a missing patient record (**Figure 1**).

As outlined in Figure 1, 83 out of 142 patients (58.5%) were advised to participate in GLA:D. Among the 83 who were advised to participate, 18 (21.7%) participated in the GLA:D programme, and 14 (16.9%) completed the three-month follow-up. Of the 59 patients who were not advised to participate in GLA:D, 27 (45.8%) were immediately scheduled for TKR, and 32 (41.5%) were neither candidates for GLA:D nor TKR. This group included patients with other knee pathology as the cause of their main symptoms (rheumatoid arthritis, synovitis, meniscal pathology), patients with severe comorbidity, patients in need of general rehabilitation and patients advised to initiate other non-surgical treatment (such as weight loss and advice on self-coping strategies including pain management and to avoid activities such as kneeling, squatting and heavy lifting). The 27 patients

who had surgery (Figure 1) included only those assigned directly to surgery after the consultation; not patients assigned to surgery at a later stage.

Patients advised to GLA:D were on average 65 years old and 71.1% were female (**Table 1**). They were either not eligible for surgery or awaiting surgical decision. There were no statistically significant differences in sex distribution or age between those who were advised to participate in GLA:D, those scheduled for surgery or those who were neither a candidate for TKR or GLA:D. The KL grade for the patients advised to participate in GLA:D and those who were neither a candidate for TKR or GLA:D was mainly 2-3, while it was mainly 3-4 for patients scheduled for TKR.

On average, patients who participated in GLA:D (n = 18) were 65.2 years old and 66.7% were female. Among the 18 patients who participated in GLA:D, 14 completed the three-month follow-up. For these patients, the mean (SD) VAS pain score was 61.4 (± 18.6) before their GLA:D participation, which improved by 18.7 (95% confidence interval (CI): –8.8- –28.7) points (p < 0.001) after three months. The mean (SD) knee-related QOL was 41.5 (± 16.2) before participation in GLA:D and remained about the same with a mean improvement of 2.2 (95% CI: 9.8- –5.3) points (p = 0.535) after three months.

TABLE 1

Characteristics of the population.

	Advised to GLA:D (N = 83)	Scheduled for TKR (N = 27)	Candidate for neither TKR nor GLA:D (N = 32)	p-value
Sex, female n (%)	59 (71.1)	17 (63.0)	18 (56.3)	0.304[a]
Age, yrs, mean ± SD	65.0 ± 10.7	69.5 ± 10.1	67.2 ± 13.8	0.179[b]
KL grade[c], n (%)				< 0.001[d]
0	1 (1.3)	0	0	
1	7 (9.2)	0	1 (3.2)	
2	34 (44.7)	1 (3.8)	14 (45.2)	
3	24 (31.6)	13 (48.1)	11 (35.5)	
4	10 (13.2)	13 (48.1)	5 (16.1)	

ANOVA = analysis of variance; GLA:D = The Good Life with osteoArthritis in Denmark programme; KL = Kellgren-Lawrence; SD = standard deviation; TKR = total knee replacement.
a) Chi-squared test.
b) 1-way ANOVA test.
c) Could not be assessed for 9 patients due to no available X-ray.
d) Fisher-Freeman-Halton Exact test.

DISCUSSION

Main findings

This observational cohort study presents the clinical course of treatment for patients with knee OA who were recommended by an orthopaedic surgeon to GLA:D to participate in the GLA:D programme. We found that only 22% of patients with knee OA who were advised to participate in the GLA:D treatment actually participated, and only 17% completed the three-month follow-up. These data indicate that treatment of knee OA with GLA:D is underutilised.

Why do so few patients follow the surgeon's advice?

As presented in this study, the majority of the patients never started GLA:D, even though this was recommended to them by their orthopaedic surgeon. Several explanations are possible. Firstly, in most cases physiotherapy treatment is associated with a fee. Patients who are referred to physiotherapy may have followed three different pathways: 1) referred from their general practitioner (GP) to a private physiotherapy clinic, in which case there is a fee of approximately 2,500 DKK [15] equivalent to 60% of the overall cost of treatment; 2) no GP referral, in which case the patient pays the full cost; and 3) referred by the orthopaedic surgeon to treatment with GLA:D in the municipality, in which case the treatment is free of charge [8]. A previous study has shown that low income is a barrier to adherence to physiotherapy [16]. Secondly, patients had to take the initiative to identify a physiotherapy clinic where GLA:D was offered. Although the orthopaedic surgeon presented the GLA:D webpage where all clinics that offered certified GLA:D programmes are easily found [17], more patients might have attended if they had received a formal referral to a GLA:D-certified clinic. After 2015, patients who are considered to benefit from GLA:D are routinely being referred directly to GLA:D in the municipality by the orthopaedic surgeon, which may increase the participation rate and adherence. Thirdly, some patients may have contacted a local physiotherapy clinic that did not offer the GLA:D programme where they may have received comparable treatment, but were not registered in the GLA:D database. Finally, completing the GLA:D programme requires time to go to the physiotherapy clinic, and preferably continue the exercise after the three-month programme ends. Out of the 18 patients (77%) who initiated GLA:D, four did not complete the questionnaire after three months, possibly indicating that they did not complete the exercise programme. It has previously been shown that patients' perceptions of their own disease can be a barrier to exercise adherence if, for example, the patient is doubtful about the effect and safety of exercising [18]. These results indicate the importance of improving the knowledge and understanding among patients that exercise will not aggravate the knee OA. That patients fail to follow the recommendation of their doctor is not uncommon. In a study involving home exercise in patients with knee OA, compliance was found to be approximately 30% [19]. Even though a compliance rate below 100% was expected in our study, we did not expect that only one in five would follow the surgeon's advice.

GLA:D is effective

Patients who participated in GLA:D had a significant reduction in pain, highlighting that those who follow the surgeon's recommendation of exercise treatment achieve good results. This finding is consistent with recent results from the GLA:D registry. Skou and Roos report a mean VAS intensity improvement of 13.8 mm in more than 3,000 patients after three months, which is comparable to our study's result of 18.7 mm improvement [8]. Furthermore, the study based on the GLA:D registry found an improvement in KOOS QOL of 6.2 points, while we found an improvement of 2.2 points (although this was not statistically significant). The difference in KOOS QOL results could potentially be due to the limited sample size of our study.

Study limitations

The limitations of this study are that the generalisability of our results might be limited because the cohort of patients was recruited via a single orthopaedic surgeon. Since the clinical assessment and recommendation of treatment might differ between surgeons, this could potentially cause selection bias. However, the patients who are advised to participate in GLA:D are similar to all patients in the GLA:D database with respect to age (64.4, here 65 years) and gender (74% women, here 71%) [6], suggesting that the results are externally valid. We do not have further information available to assess the reasons why patients did not follow the surgeon's advice. It is possible that the GLA:D participants have a different socioeconomic status, private health insurance to pay for the physiotherapy or other factors that would be difficult to take into account in this study. Future semi-structured interviews might help identify the reasons why patients fail to follow the recommendations of the surgeon. Finally, the pain-relieving effect of the GLA:D programme cannot be generalised due to the small sample size and because of the non-controlled nature of the present study. However, the positive effect of exercise therapy for knee OA has already been established in a large number of randomised controlled trials [20].

CONCLUSIONS

This study found that the majority of patients did not follow the surgeon's advice to attend non-surgical treatment. The significant pain reduction found in GLA:D participants indicates that patient education and supervised exercise therapy such as the treatment given in the GLA:D programme may be beneficial, either prior to deciding on knee replacement or if surgery is not indicated. The reasons why patients do not follow the surgeon's recommendations to participate in GLA:D should be further investigated to ensure that patients reap the full potential of this treatment.

CORRESPONDENCE: *Sofie Ryaa.* E-mail: sofie.ryaa@gmail.com

ACCEPTED: 6 April 2018

CONFLICTS OF INTEREST: Disclosure forms provided by the authors are available with the full text of this article at www.danmedj.dk

LITERATURE

1. Christensen AI, Davidsen M, Ekholm O et al. Danskernes Sundhed – Den Nationale Sundhedsprofil 2013. Copenhagen: The National Board of Health, 2014.
2. Styregruppen for DKR. Dansk Knæalloplastikregister, Årsrapport 2016. Copenhagen: Steering committee of Danish Arthroplasty Register, 2016.
3. Sundhedsstyrelsen. Knæartrose – nationale kliniske retningslinjer og faglige visitationsretningslinjer. Copenhagen: The National Board of Health, 2012.
4. NICE. Osteoarthritis: care and management (CG177). London: National Institute for Health and Care Excellence, 2014.
5. Skou ST, Odgaard A, Rasmussen JO et al. Group education and exercise is feasible in knee and hip osteoarthritis. Dan Med J 2012;59(12):A4554.
6. Skou ST, Roos EM. GLA:D – Annual report 2015. Odense: GLA:D, 2016.
7. Ageberg E, Roos EM. Neuromuscular exercise as treatment of degenerative knee disease. Exerc Sport Sci Rev 2015;43:14-22.
8. Skou ST, Roos EM. Good Life with osteoArthritis in Denmark (GLA:D): evidence-based education and supervised neuromuscular exercise delivered by certified physiotherapists nationwide. BMC Musculoskelet Disord 2017;18:72.
9. Skou ST, Roos EM, Laursen MB et al. A randomized, controlled trial of total knee replacement. N Engl J Med 2015;373:1597-606.
10. Carr AJ, Robertsson O, Graves S et al. Knee replacement. Lancet 2012;379: 1331-40.
11. ellgren JH, Lawrence JS. Radiological assessment of osteo-arthrosis. Ann Rheum Dis 1957;16:494-502.
12. Hjermstad MJ, Fayers PM, Haugen DF et al. Studies comparing numerical rating scales, verbal rating scales, and visual analogue scales for assessment of pain intensity in adults: a systematic literature review. J Pain Symptom Manage 2011;41:1073-93.
13. Roos EM, Roos HP, Lohmander LS et al. Knee Injury and Osteoarthritis Outcome Score (KOOS) – development of a self-administered outcome measure. J Orthop Sports Phys Ther 1998;28:88-96.
14. Collins NJ, Prinsen CAC, Christensen R et al. Knee Injury and Osteoarthritis Outcome Score (KOOS): systematic review and meta-analysis of measurement properties. Osteoarthr Cartil 2016;24:1317-29.
15. Takster for fysioterapi. Copenhagen: The Association of Danish Physiotherapists, 2017.
16. Tuakli-Wosornu YA, Selzer F, Losina E et al. Predictors of exercise adherence in patients with meniscal tear and osteoarthritis. Arch Phys Med Rehabil 2016;97:1945-52.
17. www.glaid.dk (1 Sep 2017).
18. Holden MA, Nicholls EE, Young J et al. Role of exercise for knee pain: What do older adults in the community think? Arthritis Care Res (Hoboken) 2012;64:1554-64.
19. Ravaud P, Giraudeau B, Logeart I et al. Management of osteoarthritis (OA) with an unsupervised home based exercise programme and/or patient administered assessment tools. A cluster randomised controlled trial with a 2x2 factorial design. Ann Rheum Dis 2004;63:703-8.
20. Juhl C, Christensen R, Roos EM et al. Impact of exercise type and dose on pain and disability in knee osteoarthritis: a systematic review and meta-regression analysis of randomized controlled trials. Arthritis Rheumatol 2014;66:622-36.